

Internship Proposal

Academic Year 2018-2019

1. Host team :

Research Unit (e.g. Department or Institute) : UMR CNRS 8246 / INSERM U1130 / UPMC
Research Unit Director : Hervé Chneiweiss
Research Team Director : Sakina Mhaouty-Kodja
Team name : Neuroplasticity of Reproductive Behaviors

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2. Internship project title:

Behavioral effects and neural mechanisms underlying adult exposure to an environmental endocrine disrupter

3. Internship Description :

Endocrine disrupters are exogenous natural or man-made molecules able to interfere with endogenous hormones or their signaling pathways in the regulation of endocrine functions. If their peripheral effects are largely documented, their effects and mechanisms in the nervous system still need to be clarified. In this context, the team is interested in the effects and mechanisms of adult exposure to phthalates on the expression of reproductive behaviors. The extensive use of de phthalates in the industry and the manufacturing of daily life products results in a wide environmental contamination. These molecules have been described as anti-androgenic, but their precise mechanisms were not clearly identified. In males, testosterone acts through neural oestrogenic and androgenic pathways to regulate the expression of male behaviors. The team showed that chronic exposure of adult male mice to di(2-éthylhexyle) phthalate (DEHP) at environmental doses reduces the emission of ultrasonic vocalizations and delays the initiation of mating, without any alteration of circulating levels of testosterone (Dombret et al. 2017). Proteomic analysis of the preoptic nucleus, a key region in the motivation to vocalize and mate, showed that the androgen receptor is a main target of DEHP exposure. The aim of this project is to i) determine if exposure to the environmental mixture of phthalates induces the same behavioral and neural effects as DEHP alone, and ii) characterize the cellular alterations induced by DEHP alone and in mixture. The behavioral analyses will include several tests developed and currently by the team (olfactory preference, partner choice, recording of ultrasonic vocalizations, mating...). The cellular and molecular analyses will include proteomic analysis, immunohistochemistry, qRT-PCR...

The data from this study will be of great relevance in the evaluation of adult exposure, an underestimated period in risk assessment of environmental exposure to endocrine disrupters.